

North Pacific Data Buoy Advisory Panel Annual Report for 2002/2003

Submitted to:

September 18, 2003

- Data Buoy Co-operation Panel (DBCP)
- PICES, Physical Oceanography and Climate Committee

Summary of Activities for 2002 - 2003

The NPDBAP was officially accepted as an entity reporting to the DBCP and PICES at the DBCP 18 meeting held in October, 2002. This is the first Annual Report as an official body of the DBCP.

During the period August 2002 to August 2003 an average of 57 drifting buoys deployed in the North Pacific Ocean (30.00N to 65.00N and 110.00E to 110.00W), reported via the Global Communications System (GTS) to the Marine Environmental Data Service (MEDS). Tables 1 and 2 provide information on the inventory of active buoys. As of August 2003, 71 buoys were reporting, 44 with barometric pressure which are shown in bold text in Table 1. Figures 1 to 5 show breakdowns of the number of buoys in operation and the number of messages received during the period. The total number of messages received increased from 19,165 in August 2002 to 29,841 in August 2003, the latest month for which statistics are available. Hopefully, this increase is in part, due to the efforts of the participating members of the NPDBAP. The tables and figures were compiled by MEDS and are available on the new NPDBAP web site.

Meetings

An "ad hoc" meeting of the Panel was held during the DBCP 18 meetings held Oct. 14-18, 2002 in Martinique. During this meeting the action items from the June 2002 meeting were discussed including buoy deployment opportunities. Representatives from Canada and the United States (NDBC, US Naval Oceanographic Office and the Global Drifter Program) were in attendance. There was not sufficient attendance by NPDBAP members to have a meeting during the PICES 11 Annual Meeting in Qingdao, China, October 18 - 26, 2002. A meeting was held during the DBCP meeting in Angra dos Reis, October 21, 2003.

Status of Workplan Action Items for 2002 - 2003

At the initial formative meeting of the Panel, held June 5 - 7, 2002, the following work plan items were identified as being actions the Panel should complete over the next year. The action taken on each item is presented.

1. Work plans for coming year (Deployments, web page, annual report).
The Panel discussed the urgent items for the coming year, including a strategy to include all the PICES member countries in the work of the Panel. To be effective in this goal, attendance of a Panel representative at the PICES 11 Annual Meeting in Qingdao, China, Oct. 18 - 26, 2002, was recognized as being desirable. The annual DBCP meeting, will be held Oct. 14-18, 2002 in Martinique.

Action Taken: Brian O'Donnell (North American Co-Chair, NPDBAP) and Ron McLaren (Technical Co-ordinator, NPDBAP) attended the PICES 11 Annual Meeting in Qingdao, China. Presentations were made as per the following descriptions.
2. Electronic Presentation for Poster Session at PICES 11 - Wed. Oct 23rd. 5:30-8:30 PM
Participation in this event is seen as important to expand the participation in the work of the Panel. To achieve this goal, under the direction of the Panel Co-Chair, the Technical Coordinator of the Panel will: Design and implement an electronic poster presentation on the work of the Panel with assistance from Ms. Estelle Couture (MEDS) and Regional MSC computer support.

Action Taken: A presentation explaining the progress to date and the objectives of the NPDBAP was created and displayed at the Electronic Poster Session at PICES 11. There was general interest, however, there were few attendees involved in the deployment of drifting buoys so the presentation was more of academic interest than a recruitment tool.

3. PICES / CLIVAR Workshop PICES 11 - Sun. Oct. 20th.

Attendance at this session could be of benefit to the Panel

The Technical Coordinator of the Panel will investigate opportunities to have an NPDBAP representative attend this session.

Action Taken: We were unable to attend this session due to our attendance at the DBCP meeting held in Martinique the previous week

4. MONITOR Workshop, PICES 11, Monitoring from Moored and Drifting Buoys, Wed. Oct 23rd.

Attendance at this session could be of benefit to the Panel. The Technical Coordinator of the Panel will investigate opportunities to have an NPDBAP representative attend this session.

Action Taken: A presentation was made at this session. The presentation described the work of the NPDBAP, the DBCP and provided a technical overview of drifting buoy hardware and communication processes.

5. Annual report of the work of the Panel for presentation to the DBCP and PICES/POC prior to PICES 11. The POC committee meetings will be held on Wed. Oct. 23rd at the PICES 11 Annual Meeting.

The Technical Coordinator of the Panel will prepare a report on the activities of the Panel for submission to DBCP and PICES/POC.

Action Taken: An annual report was prepared by Ron McLaren and submitted to the DBCP and PICES/POC prior to PICES 11.

6. Buoy deployments for 2002/2003

The Technical Coordinator will work with MSC, NDBC and NAVO to determine the deployment locations for the 2002 air drop of SVP-B buoys.

Action Taken:

Canada

The respective groups were consulted and a deployment zone between 40 to 50 degrees north and 160 to 170 degrees west was agreed to. Air deployments were completed by US Naval Oceanographic Office (NAVO) aircraft in September 2002, and May 2003, deploying 14 Canadian SVP-B Buoys (with barometers). An additional 8 Canadian buoys with barometers were deployed by Voluntary Observing Ships (VOS).

United States

NDBC arranged the deployment of two Surface Velocity Profilers with Barometers and Wind (SVP-B/WSD) drifting buoys in the Bering Sea in January 2003. Vessels in the U.S. National Weather Service (NWS) Voluntary Observing Ship (VOS) program performed the deployments. NDBC also arranged the deployment of a third SVP-B/WSD drifting buoy in the northern Gulf of Alaska in May 2003 near buoy station 46080 and deployed a prototype Air-Deployed Self-Moored Expendable (ADSMEX) buoy, in the northeast Gulf of Alaska (57.1 N 141.2W) in January 2003. ADSMEX technology consists of a drifting buoy hull and electronics used in the First GARP Global Experiment (FGGE) and the beginning of the Tropical Ocean Global Atmosphere (TOGA) Research Program, combined with an anchor and one-eighth inch (3.175 mm) diameter spectra line mooring system that spools out at deployment.

NAVO air deployed 3 MetOcean SVP-B drifters in the Sea of Japan in April (and 3 Argo-equivalent floats at the same locations). WMO numbers and positions follow: 21571/36 55N 130 65E 21572/38 37N 129 57E 21573/38 04N 131 06E

Japan

The Japan Meteorological Agency (JMA), Japan Coast Guard (JCG), Japan Marine Science and Technology Center (JAMSTEC), Tohoku University and National Institute of Polar Research (NIPR) deployed a total of 162 buoys (surface drifting buoy 23; profiling float 121; mooring TRITON 18) in the areas of around Japan, Japan Sea, the western North Pacific, tropical Pacific, south Pacific, Indian Ocean, Southern Ocean, Arctic Ocean and Antarctic Ocean. for oceanographic research and operational purposes. Approximately 21 of these buoys were deployed in the seas surrounding Japan and the Western North Pacific Ocean. The data are distributed on the GTS, with the header from "SSVB01 RJTD" to "SSVB19 RJTD".

7. Web Page

Paul Moersdorf offered to host the NPDBAP web site at the NDBC facilities at Stennis Space Centre. Ron McLaren with the help of Estelle Couture agreed to start building the web site.

Action Taken: The Web page was completed and can be found at: <http://npdbap.noaa.gov>. The web site explains the goals of the NDDBAP, Operating Principles, Membership Information and provides access to MEDS for buoy data. I would like to thank Cara Schock and Estelle Couture at MEDS, and Cheryl Demers and Steve Collins at NOAA/NDBC for their work in creating the page. I'd also like to thank Dr. Paul Moersdorf, National Data Buoy Centre, for offering to host the web site. Minor changes will be made over the next few months to include the Meteorological and Oceanographic web site links of the member countries.

The NDBC web page also displays NPDBAP drifting buoy data for the Eastern North Pacific in real time. (<http://www.ndbc.noaa.gov>). See Figure 6 and 7 for sample pages from the NPDBAP and NOAA web sites.

Overview of Plans for 2003 - 2004

A meeting of the NPDBAP is scheduled On October 11, 2003, in conjunction with The North Pacific Marine Science Organization (PICES) Twelfth Annual Meeting to be held October 10-18 at the Conference Hall of the Mayfield Hotel, Seoul, Korea. Initial response to the meeting announcement has not been encouraging, and it is expected that another "ad hoc" meeting of the Panel will be held in conjunction with the DBCP meeting which will be held in Angra dos Reis – Rio de Janeiro, Brazil, from October 20 to 24 , 2003.

An Asian Co-chair has not yet been selected and the current North American Co-chair, Brian O'Donnell, has been assigned to a position with Climate Change and the Earth Observation System project. His future involvement with the NPDBAP will be decided over the next few months.

Deployments and New Initiatives for 2003 - 2004

United States

In 2004 NDBC will fund barometer upgrades to 40 SVP-B drifting buoys that will be deployed for the Global Drifter Program (GDP) in the North Pacific. In addition to benefiting GDP research goals, the measurements from the buoys will be useful for better defining surface pressure fields for operational meteorological models used for North America. NAVO has plans to deploy up to 21 SVP-B drifters in the East China Sea/Yellow Sea area for next fiscal year.

Japan

JMA, JCG, JAMSTEC, Tokai University and NIPR plan to deploy in 2004 a total 148 buoys (surface drifting buoys 25; profiling floats 105; moorings TRITON 18). These buoys are scheduled to be deployed in the areas of around Japan, Japan Sea, the western North Pacific, tropical Pacific, south Pacific, Indian Ocean, Southern Ocean, Arctic Ocean, Antarctic Ocean and Okhotsk Sea for oceanographic research and operational purposes. Approximately 24 of these buoys will be deployed in the seas surrounding Japan and the Western North Pacific Ocean.

Canada

Canada will be deploying 6 to 12 SVP-B drifting buoys over the next year, by airdrop in co-operation with NAVO or by VOS vessels. Additionally, up to 10 barometer upgrades will be funded for deployment by the Global Drifter Program (GDP) in the North Pacific.

Reports for North Pacific Drifting Buoys (August 2002 – July 2003) (30.00N to 65.00N and 110.00E to 110.00W)

Table 1. Monthly statistics of the number of drifting buoys reporting on the GTS and the number of messages archived at MEDS from these buoys

Year	Month	# Messages	# Buoys	Avr_Obs_per_buoy
2002	08	19165	53	361.60
2002	09	19897	57	349.07
2002	10	20922	57	367.05
2002	11	19448	53	366.94
2002	12	20178	52	388.04
2003	01	20015	50	400.30
2003	02	16974	52	326.42
2003	03	19733	49	402.71
2003	04	20304	52	390.46
2003	05	24101	60	401.68
2003	06	26992	65	415.26
2003	07	30324	65	466.52
2003	08	29841	71	420.30

Table 2. Buoy Inventory as of Sep. 17, 2003



Drifting Buoy Inventory / Inventaire des bouées dérivantes

CODE	Parameter	Paramètre
SST	Sea surface temperature	Température de la surface de la mer
ATM	Atmospheric pressure at sea level	Pression atmosphérique à la surface de la mer
WSP	Wind speed	Vitesse du vent
WDI	Wind direction	Direction du vent
DRY	Air temperature	Température de l'air
ATP	Atmospheric pressure tendency	Tendance de la pression atmosphérique
DRD	Depth of drogue	Profondeur de la drogue
SCS	Surface current speed	Vitesse de la dérive
SCD	Surface current "flow toward" direction	Direction de la dérive "en direction vers"

IDENT.	TOT.	DATE	LATITUDE	LONGITUDE	PARAMETERS / PARAMÈTRES
	OBS.	FROM/DE TO/À			
21533	709	2003/08/01-2003/08/31	48.91N-50.26N	147.55E-150.07E	SST ATM ATP DRD
21535	223	2003/08/03-2003/08/13	30.00N-30.45N	142.16E-142.91E	SST ATM WSP WDI ATP DRD
21571	656	2003/08/01-2003/08/31	39.55N-41.99N	141.58E-142.76E	SST ATM ATP DRD
21572	706	2003/08/01-2003/08/31	36.66N-38.58N	131.86E-135.37E	SST ATM ATP DRD
21573	471	2003/08/01-2003/08/22	38.00N-38.33N	131.20E-131.82E	SST ATM ATP DRD
21635	611	2003/08/04-2003/08/31	30.00N-33.56N	134.62E-140.06E	SST ATM WSP WDI ATP DRD
21677	335	2003/08/01-2003/08/27	40.72N-41.43N	139.73E-140.79E	SST DRD
IDENT.	TOT.	DATE	LATITUDE	LONGITUDE	PARAMETERS / PARAMÈTRES

Final

[illegible]

MEDS/SDMM 17/09/2003.

Figure 1. Tracks of drifting buoys for August, 2003

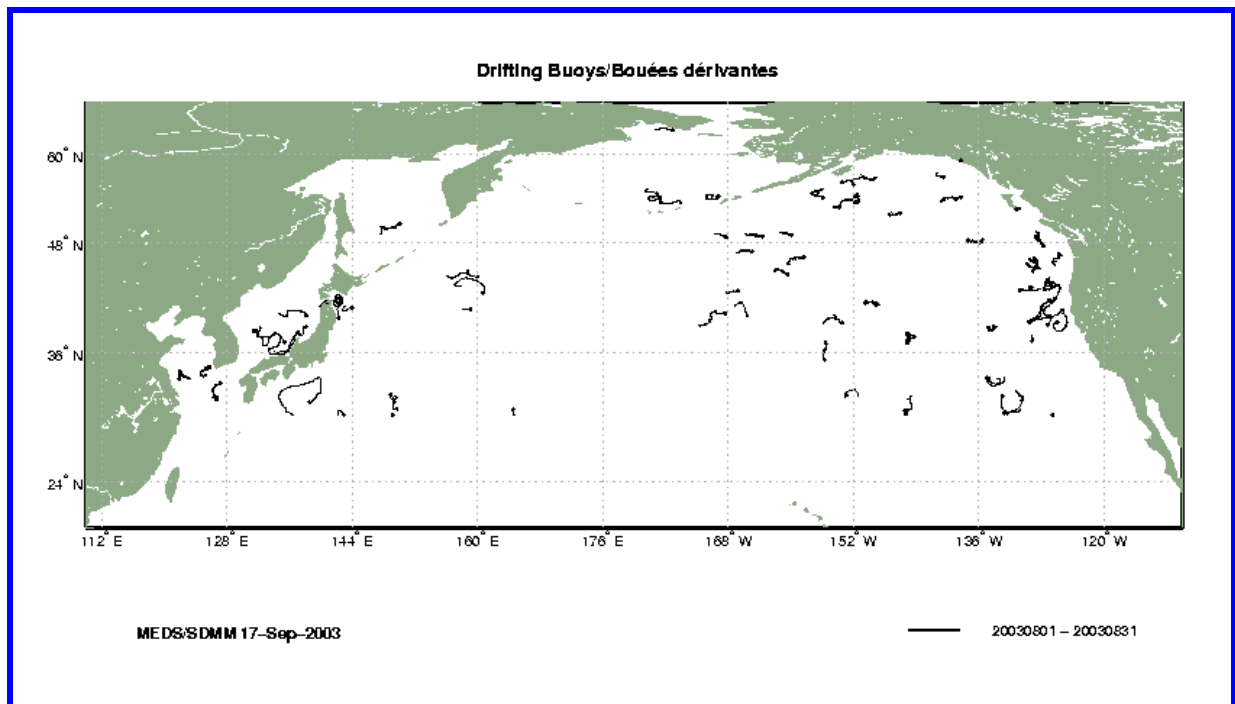


Figure 2. Number of buoys and other platforms reporting in BUOY code in 2002.

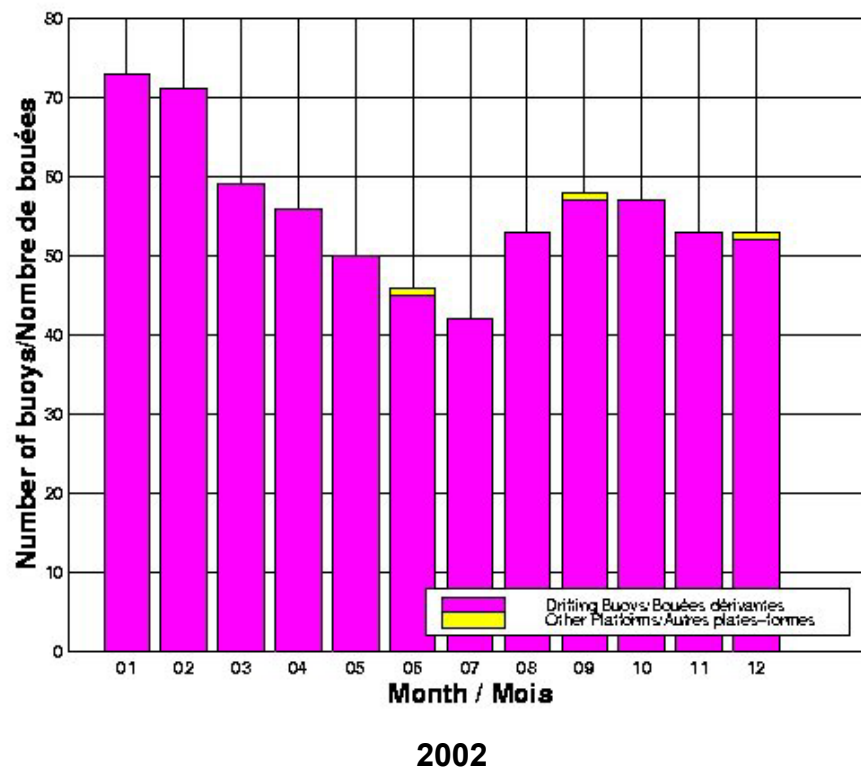


Figure 3. Number of buoys and other platforms reporting in BUOY code in 2003.



Figure 4. Number of GTS messages archived at MEDS from drifting buoys and other platforms reporting in BUOY Code in 2002.

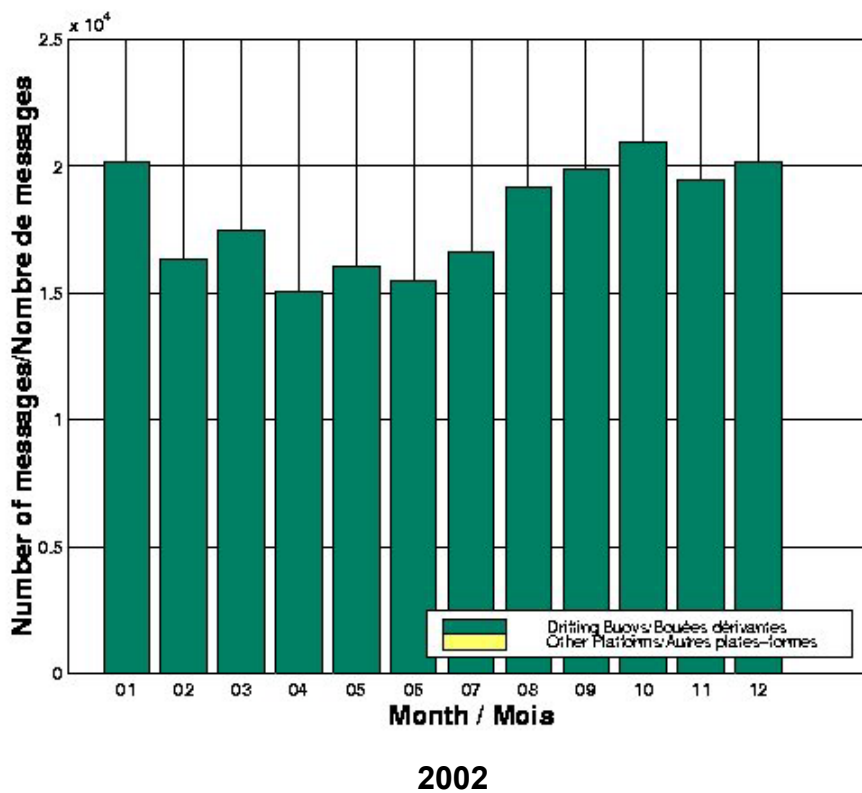


Figure 5. Number of GTS messages archived at MEDS from drifting buoys and other platforms reporting in BUOY Code in 2003.

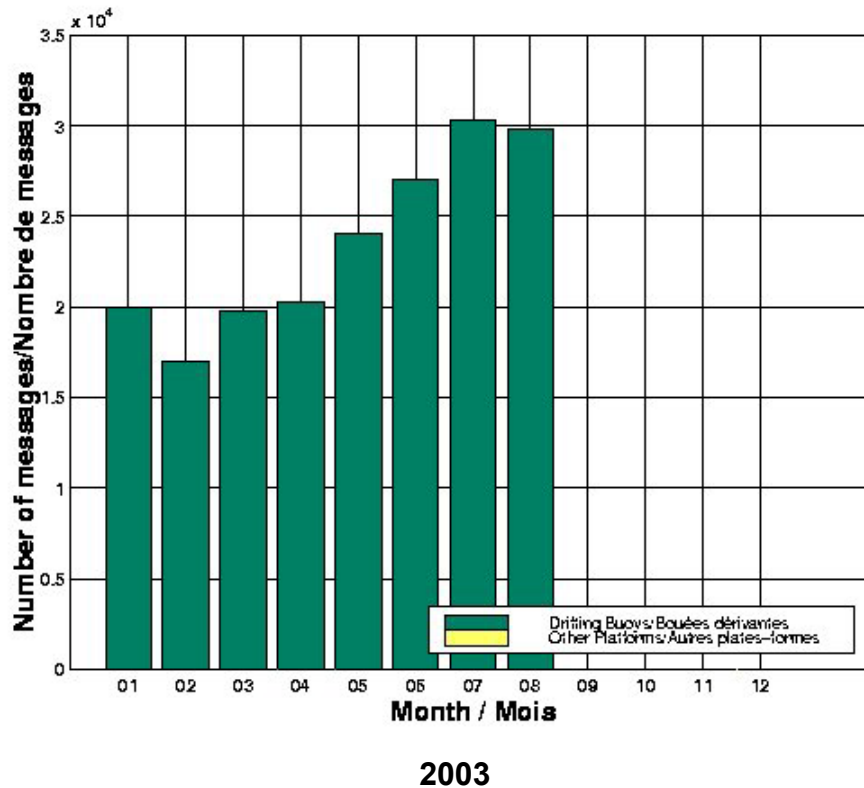
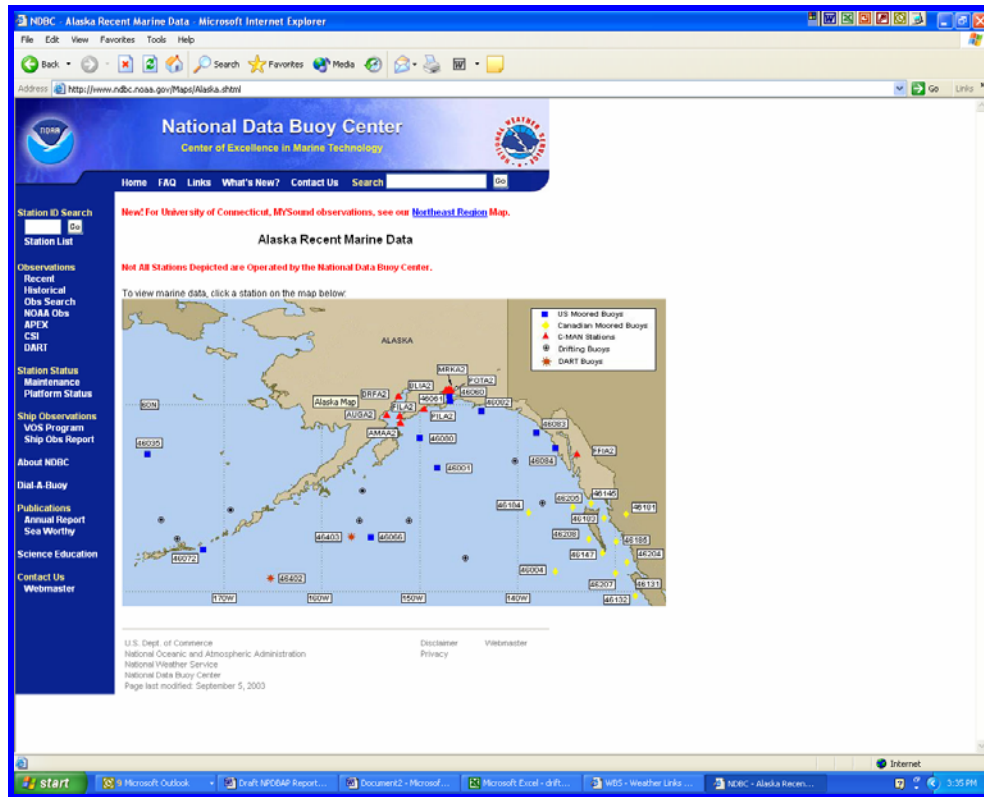


Figure 6. NPDBAP "Overview" Web Page



Figure 7. NDBC North Eastern Pacific Real Time Buoy Data page:



National Reports (Submitted as of September 10, 2003)

Canada

- As of August 31, 2003, there are 25 active Canadian drifters in the North Pacific Ocean (22 SVP-B, 2 SVP-BW and one TOGA). All buoys report sea level pressure, sea surface temperature and wind information, if so equipped. This number increased from 11 active drifters in August of 2002.
- Fourteen Canadian SVP-B buoys were air deployed by the U.S. Naval Oceanographic Office (NAVO) in September, 2002, and May, 2003, between 40 to 50 degrees north and 160 to 170 degrees west. The remainder of the buoys were deployed by Voluntary Observing Ships (VOS) in the same general deployment zone.
- The 2 SVP-BW drifters that reported winds appeared to provide good wind data, although one speed sensor failed after 5 months.
- A listing of drifting buoys in the North Pacific, trajectory maps and data summaries are available from the Marine Environmental Data Service (MEDS), a branch of Canada's federal Department of Fisheries and Oceans (DFO). As part of its role, MEDS acquires, processes, quality controls and archives real-time drifting buoy messages reporting over the Global Telecommunications System (GTS) as well as delayed mode data acquired from other sources. MEDS site: http://www.meds-sdmm.dfo-mpo.gc.ca/alphapro/modc/main_npac_e.shtml
- Future plans include the deployment of 6-12 SVP-B buoys over the next year and the upgrading of up to 10 SVP drifters in co-operation with the Global Drifter Program for deployment in the North Pacific.

United States

- NDBC continued to process and distributes data from four (4) profiling floats that were deployed in December 2001.
- NDBC arranged deployment of two Surface Velocity Profiler with Barometer and Wind (SVP-B/WSD) drifting buoys in the Bering Sea in January 2003. Vessels in the U.S. National Weather Service (NWS) Voluntary Observing Ship (VOS) program performed the deployments. All buoys are still returning sea surface temperature, atmospheric pressure and wind data, along with position information necessary to calculate ocean surface currents. The wind speed algorithm used on these buoys is an older version whose accuracy is known to deteriorate when wind speed exceeds approximately 17 meters per second (m/s).
- NDBC arranged deployment of a third SVP-B/WSD drifting buoy in the northern Gulf of Alaska in May 2003 near buoy station 46080. The drifter, loaded with a newer wind speed algorithm proposed by Meteo France, was deployed near the moored buoy in order to compare wind measurements. However, the drifter moved away from the moored buoy too soon to validate that the new wind algorithm provides more accurate observations at higher speeds than those obtained using the original algorithm. Comparison at low speeds was good.
- NDBC deployed a prototype, the Air-Deployed Self-Moored Expendable (ADSMEX) buoy, in the northeast Gulf of Alaska (57.1 N 141.2W) in January 2003. ADSMEX technology consists of a drifting buoy hull and electronics used in the First GARP Global Experiment (FGGE) and the beginning of the Tropical Ocean Global Atmosphere (TOGA) Research Programme, combined with an anchor and one-eighth inch (3.175 mm) diameter spectra line mooring system that spools out at deployment. In this case, the mooring is 12,000 feet (3,660 meters) long. The experiment is to determine whether the ADSMEX concept is suitable as a limited capability replacement to standard moored buoys systems. The applications might include failed moored buoys that cannot be repaired for a long time, targeted seasonal monitoring, and as a quick response monitoring system in the event of a hazardous spill.
- In 2004, NDBC is funding barometer upgrades to 40 SVP-B drifting buoys that will be deployed for the Global Drifter Program (GDP) in the North Pacific. In addition to benefiting GDP research goals, the measurements from the buoys will be useful for better defining surface pressure fields for operational meteorological models used for North America.
- NAVO air deployed 3 MetOcean SVP-B drifters in the Sea of Japan in April (and 3 Argo-equivalent floats at the same locations). WMO numbers and positions follow: 21571/36 55N 130 65E 21572/38 37N 129 57E 21573/38 04N 131 06E. NAVO has plans to deploy up to 21 SVP-B drifters in the East China Sea/Yellow Sea area for next fiscal year.

Japan

- Buoys are operated by various agencies and report SST, Air Pressure, Significant Wave Height and the Period. The data are distributed on the GTS, with the header from "SSVB01 RJTD" to "SSVB19 RJTD".
- In 2003, Japan deployed a total 162 buoys (surface drifting buoy 23; profiling float 121; mooring TRITON 18) in the areas of around Japan, Japan Sea, the western North Pacific, tropical Pacific, south Pacific, Indian Ocean, Southern Ocean, Arctic Ocean and Antarctic Ocean. for oceanographic research and operational purposes by Japan Meteorological Agency (JMA), Japan Coast Guard (JCG), Japan Marine Science and Technology Center (JAMSTEC), Tohoku University and National Institute of Polar Research (NIPR). Approximately 21 of these buoys were deployed in the seas surrounding Japan and the Western North Pacific Ocean.

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Prepared by:
Ron McLaren
Technical Coordinator - NPDBAP
ron.mclaren@ec.gc.ca